

Radiation**Safety****Committee**

Minutes of Radiation Safety Committee of May 18, 2004

Review of AGS Cold Snake and Penetration into AGS Ring

Present: P. Bergh, A. Etkin, H. Huang, R. Karol, E. Lessard, A. Pendzick, K. Yip

The Committee reviewed the proposed AGS cold snake magnet and penetration. A. Pendzick made the presentation. The snake magnet and penetration will be installed at the A20 position. The penetration is a 50 ft. long 14" ID straight steel pipe placed at a ~10 degree angle. It ends about 10 ft. from Ring Rd. At the ring end, it penetrates below the beam height. If the snake magnet is on, it is a limiting aperture, but beam intensity would be low.

K. Yip used results from a previous calculation showing that, for an 18" pipe penetration, each proton lost at the penetration location in the ring results in 4×10^{-17} rem/p at the mouth of the penetration. Assuming 100 TP/s, this would be a dose rate of 14.4 rem/h. A. Pendzick estimated that a 14" penetration would have about half the dose rate with additional reduction from the materials contained inside the penetration pipe.

E. Lessard noted that the helium system used to cool the snake magnet would be a source of tritium. There are both a high pressure, closed loop and a low pressure, open loop helium systems. A NESHAP review by ESWMD needs to be documented to show the annual activity released before operations can begin. This will show that continuous monitoring of the release is not necessary.

This section of the AGS ring was discussed for its history of beam losses and the potential for the cold snake to create losses (see attachment 1).

The following Checklist Items will be tracked:

(Ck-AGS-fy2005-377) Another calculation needs to be completed for the 14" diameter penetration pipe with materials packed in it. This was completed after the meeting (see attachment 2). The 14 inch diameter sleeve with the expected packing has a dose of $1.1\text{E-}18$ rem/p . 400 mrem/hr would be expected if the full beam could be lost at the A20 snake.

(Ck-AGS-fy2005_378) Review previous fault studies of AGS penetrations (especially FS 10 and 13 on sleeves) to see if a better understanding of the source term can be achieved. It is noted that the existing sleeves are estimated to have five times more radiation for potential losses than the new A20 sleeve when both are empty. It is expected that the packing adds substantial reduction and the maximum achievable source term is lower than used in the initial estimates (note added by Chair).

(Ck-FY2005-AGS-379) Consider the final area configuration before startup, this includes posting, reviews, status of snake and materials in pipe, radiation monitoring, etc.

(Ck-AGS-fy2005-380) Conduct fault studies to verify the effectiveness of the radiation protection system installed for the penetration.

(Ck-AGS-fy2005-381) Estimate the tritium production in the helium systems each year and complete a NESHAP review to determine the dose to the maximally exposed individual. This must be done before operation with beam begins.

(Ck-AGS-fy2005-382) The helium systems must be labeled and treated as contaminated until proven otherwise.

Attachments: (file copy only)

- 1) e-mail from L. Ahrens, “ Some thoughts on the A20 cold snake as a beam aperture/radiation source”, May 6.
- 2) e-mail from K. Yip , May 28, calculation of a 14 inch diameter penetration and the reduction in dose caused by the materials in the pipe.

Distribution:

Attendees

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